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Carl Sagan once said “extraordinary claims require extraordinary evidence”.³ Such evidence was not presented, and the conclusions only muddled the waters as to whether face mask wearing protects against viral respiratory diseases, a claim that not even manufacturers of face masks dare to make.

I declare no competing interests.

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- 1 Chu DK, Akl EA, Duda S, et al. Physical distancing, face masks, and eye protection to prevent person-to-person transmission of SARS-CoV-2 and COVID-19: a systematic review and meta-analysis. *Lancet* 2020; **395**: 1973–87.
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Derek Chu and colleagues¹ concluded, based on an analysis of a subgroup of observational studies, that health-care workers might afford greater protection against SARS-CoV-2 infection from N95 respirators than from surgical masks. They acknowledge substantial limitations and rated certainty of effect as low. We would argue it is lower still, as several studies seem to have been misclassified with regard to mask type.

Yet in the linked Comment, C Raina MacIntyre and Quanyi Wang² stated that, based on those findings, N95s should be standard of care for all health-care workers working on COVID-19 wards and that guidelines³ be promptly reviewed. This statement disregards the important limitations of observational studies (eg, recall bias and limited ability to control for additional exposures), analytical shortcomings, and that the difference in protection between masks was statistically significant only when accounting for aerosol-generating procedures, consistent

with guidelines.³ Also ignored were multiple systematic reviews of N95s versus surgical masks that consistently found no significant differences in risk of respiratory illness, influenza-like illness, or the most robust outcome of laboratory-confirmed viral infection (including non-influenza respiratory viruses), after adjustment for clustering.^{4,5}

Responsible policy recommendations should weigh the totality of available evidence, with major consideration given to quality. To call for sweeping changes in policy² based on low-certainty findings that are highly susceptible to bias and contradict higher quality evidence is scientifically unjustified, and it does a disservice to front-line health-care workers relying on balanced, evidence-informed recommendations to guide use of personal protective equipment.

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- 1 Chu DK, Akl EA, Duda S, et al. Physical distancing, face masks, and eye protection to prevent person-to-person transmission of SARS-CoV-2 and COVID-19: a systematic review and meta-analysis. *Lancet* 2020; **395**: 1973–87.

Derek Chu and colleagues reported that face mask wearing in hospitals and health-care settings reduces risk of respiratory infection.¹ Surprisingly, this recommendation was extended to the general population. Summary estimates were calculated using results of three severe acute respiratory syndrome studies, of which only two yielded statistically significant results. The first study was done in households, a situation that is similar to a health-care setting.² The second was a case-control study in the general population where infected and uninfected individuals were asked via telephone interviews whether they had worn a mask during past interactions.³ This second study, in which the rate of infections was measured after the face mask use, is therefore not prospective but the type of study that is likely to suffer from recall bias. A meta-analysis of 33 randomised and observational studies, including studies done in schools and universities, showed no effect of face masks on the probability of developing influenza-like illness.⁴ Finally, in a Danish randomised controlled trial done (April–May, 2020), the recommendation to wear surgical masks outside the home (concomitant to other adopted public health measures) did not reduce SARS-CoV-2 infection rate in mask wearers at conventional levels of statistical

significance.⁵ In June, 2020, WHO advised that governments encourage the public to wear masks under two conditions: when community transmission is apparent and when physical distancing is difficult, such as on public transport, in shops, or in other confined or crowded environments.⁶ When community transmission is widespread, we agree with recommending face masks in hospitals, in assisted living communities, and where at-risk populations are cared for. Conversely, existing data do not support universal, often improper, face mask use in the general population as a protective measure against COVID-19. Nevertheless, universal face mask policy (ie, in any indoor environment) is still adopted in certain countries. Public health mandates must be based on unequivocal and strong evidence and metered on the current local epidemiological condition.

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Derek Chu and colleagues¹ examined whether physical distancing, face masks, and eye protection could prevent transmission of SARS-CoV-2. We are concerned that some of the data from the included preprints were out of date, affecting the results of the meta-analysis.

The systematic review included literature up to May 3, 2020. Seven articles, including four preprints, described the comparison of the risk of SARS-CoV-2 transmission between far and short physical distancing. Further physical distancing was associated with a lower risk of SARS-CoV-2 transmission (relative risk [RR] 0.15 compared with shorter physical distancing, 95% CI 0.03–0.73, $I^2=59\%$; appendix).

We followed up on the status of the four preprints and found that one of them² was published online on May 1, 2020,³ before the search cutoff date. The published version used a larger dataset ($n=227$ vs $n=83$ in the preprint), and the risk of SARS-CoV-2 transmission was almost equal between the physical distancing groups (RR 0.99 vs RR 0.55 in the preprint).

We updated the meta-analysis, replacing the results from the preprint by the corresponding published study.³ The association between physical transmission and the risk of SARS-CoV-2 transmission became less evident (RR 0.16, 95% CI 0.02–1.06, $I^2=70\%$; appendix).

Non-peer-reviewed preprints might be based on preliminary data that are later updated. We recommend that systematic reviews should check

the latest situation of each included preprint, if necessary by contacting the authors, to ensure that the results are up to date.

We declare no competing interests.

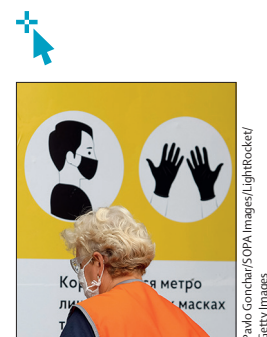
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We read with great interest the results of the systematic review¹ on the effect of personal protective equipment (PPE) to prevent SARS-CoV-2 infection, predominantly based on evidence from other betacoronaviruses. As this work raised many more questions than it answered, and because its implications are far-reaching, we highlight several salient concerns.

To evaluate the association of mask use with viral infection, the Derek Chu and colleagues completed a meta-analysis of adjusted odds ratios (aORs). However, Seto and colleagues² reported only unadjusted ORs, whereas three other investigator groups adjusted for different sets of covariates.^{3–5} Thus, the reported effect sizes are not comparable, and it might not be appropriate to combine them.⁶ Furthermore, Seto and colleagues² reported results for



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See Online for appendix